INTEROFFICE MEMORANDUM

TO: STEVE HALL

FROM: ALMA FELDPAUSCH

SUBJECT: DRAFT REVIEW OF STREAMLINED RISK EVALUATIONS – AVERY LANDING SITE EE/CA

DATE: 2/9/2010

A brief review of the Avery Landing Site (Site) EE/CA was performed, with emphasis on the nature and extent of potential contamination (Section 4) and the streamlined human and ecological risk evaluations (Section 5). General comments followed by specific comments are provided below:

1. SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCS)

Overall, the discussion of COPC selection does not provide a clear and justifiable rationale for elimination of chemicals from further consideration when they are present at levels that exceed screening levels. Also, the COPC selection process is not consistent with EPA risk assessment guidance.

Specific comments include:

1-1. QAPP Attachment 1: The QAPP includes tables with various screening values for each sampled medium and analyte. The lowest or most conservative / health-protective value was selected for each analyte, within each medium. Selection of the lowest screening levels provides a high degree of confidence that analytes not exceeding screening levels will not pose a threat to human health or the environment.

1-2. QAPP Attachment 1: Minor errors were noted in screening levels for metals (National Primary Drinking Water Standards and EPA Regional Screening Levels). In each case, the values used in the COPC screening were lower, or more health-protective, than the correct values.

1-3. QAPP Attachment 1: Sediment and surface water screening levels for total PCBs were used to screen Aroclor mixtures. Recommend using screening levels for Aroclors or using analytical results for total PCBs.

1-4. EE/CA Section 4.1.4: An analyte that exceeds a soil screening level based on protection of groundwater cannot be eliminated from further consideration if the analyte also does not exceed a groundwater screening level. Whether or not it exceeds a groundwater criterion is irrelevant if it exceeds the soil level, particularly when the soil and groundwater samples in question are not necessarily co-located. The lack of an exceedance in groundwater does not indicate that there is no potential for leaching of chemicals from soil to groundwater now or in the future.

1-5. EE/CA Section 4.1.4.2: In general, the discussion of inorganic analytes lacks clear rationale for elimination of all metals from further consideration:

- Background metals concentrations from Coeur d'Alene Basin and Washington state are used to eliminate metals as COPCs; however, no discussion of why these two background datasets are appropriate and relevant to the Site is provided (e.g., similar soil/sediment/groundwater physical and chemical characteristics, sampled depths, sample collection methods, etc) nor are these background datasets provided in tables for review. Values presented within the text were compared to values presented in the Coeur d'Alene Basin RI/FS, located online. No errors were noted.

- Comparison of mean Site and background concentrations is qualitative or semi-quantitative (simple comparison of means or commentary that concentrations are "relatively consistent" across the site). Use of an upper confidence limit of mean Site concentrations and use of statistical tools would provide a more appropriate means of comparison. Recommend use of EPA's ProUCL software to perform quantitative comparison to background levels.

- Overall discussion lacks clarity. For example, the following statement "*Because of the consistency of detections and the lack of researched regional background levels, it is reasoned that vanadium concentrations are within the normal range of Site specific background concentrations and this metal is not considered a soil COPC.*" (Pg. 51) is illogical and does not justify elimination of an analyte from further consideration. On the contrary, the lack of a background dataset would suggest that an analyte should be retained for further evaluation if it exceeds a screening level and certainly does not suggest that the analyte is present at background levels.

1-6. Section 4.1.4.3, Pg. 52: An analyte present at "mid-depth" that exceeds a soil screening level cannot be eliminated from further consideration because of its depth. It is possible that future redevelopment activities could bring this analyte to the surface where it may be contacted by human and ecological receptors.

1-7. Section 4.3.3.2, Pg. 58 and Section 4.7.4: If "*an anaerobic groundwater condition caused by the presence of petroleum hydrocarbons*" is given as a rationale for eliminating analytes from further consideration, then a discussion of this anaerobic condition and resulting chemical reactions needs to be provided in addition to data supporting the assumption that anaerobic conditions are present.

1-8. Section 4.3.4.1 and Table 4-1: It is not clear why thallium detected at concentrations above water quality standards in several wells is considered a COPC for the groundwater-to-surface water pathway but not for groundwater.

1-9. Section 4.4.3, 4.6.4, 4.7.2: The statement that negligible detections of analytes in surface water are evidence that groundwater is not discharging to surface water is not supported by the information provided. The presence of PAHs in the shoreline and near-shore sediments suggests that both groundwater and LNAPL are discharging to the river. The reason for low detections in surface water are more likely due to the sampling method (single/discrete grab samples) and the fact that PAHs are more likely to partition to organic matter in sediment and suspended particulates than to surface water. Collection of seep samples would confirm/reject the conclusion that only LNAPL is migrating to the river.

2. CONCEPTUAL SITE MODEL (CSM)

The CSM does not provide adequate depictions of analyte migration pathways and assumptions for complete/incomplete exposure pathways are not supported.

Specific comments include (all comments pertain to Figure 5-1):

2-1. All pathways for off-site residents are incomplete yet no explanation is provided. If no off-site residents are present, then this should be stated to support this assumption (particularly to eliminate the inhalation of wind-blown dust pathway).

2-2. Contact with groundwater is listed as an incomplete exposure pathway for all receptor populations except the resident. However, groundwater may be used for irrigation, in which case all receptors (residents, trespassers/recreational users, construction workers, and/or ecological receptors) may contact COPCs in groundwater. Also, future construction workers may contact shallow groundwater while performing intrusive activities (laying utilities, etc).

2-3. Fugitive dust should be considered a potentially complete pathway for ecological receptors. While it may not be quantified in the risk evaluation, it is certainly possible for receptors to inhale resuspended dust.

2-4. The CSM indicates that groundwater migrates to surface water and seep water (independent of LNAPL), which contradicts discussion of groundwater and LNAPL migration to surface water in text.

2-5. Ingestion of aquatic organisms is limited to on-site residents and recreational users. Even if this pathway is not quantified in the risk evaluation, it is also a potentially complete pathway for terrestrial wildlife and aquatic species.

2-6. Incidental ingestion of sediment should be depicted as a potentially complete pathway for terrestrial wildlife.

2-7. Incidental ingestion of soil is a potentially complete pathway for burrowing terrestrial wildlife; discuss the maximum depth at which contamination is found and maximum depth to which burrowing animals are expected.

2-8. Ingestion of and dermal contact with surface water are complete exposure pathways for terrestrial wildlife, but are listed as insignificant and incomplete, respectively, in the CSM.

3. QUANTITATIVE RISK EVALUATION

Methodology for risk calculations is not consistent with EPA risk assessment guidance and risks do not adequately address potential exposures to receptors at the Site. There is low confidence in the conclusions provided in Section 6.1.1 due to incomplete characterization of risks for future residents to all relevant exposure media and incomplete characterization of risks to ecological receptors for contact with sediment.

Specific comments include:

3-1. Section 5.2.1: The maximum depth to which humans and burrowing animals are expected to access subsurface soils should be defined to support depth of soils data evaluated in risk evaluations. Also, the potential for bringing subsurface soils to the surface during future grading and excavation associated with site redevelopment should be mentioned.

3-2. Table I-1, I-2: Idaho's Risk Evaluation Manual (REM) provides some exposure assumptions that are inconsistent with and in some cases less health-protective than EPA risk assessment guidance. For example, the REM provides an exposure frequency (EF) of 270 day/yr and exposure duration (ED) of 15 years whereas EPA recommends an EF of 350 day/yr and ED of 30 years for residents, respectively. Also, recommended skin surface area values and dermal absorption fraction from soil are slightly lower in the REM compared to EPA guidance. Alternatively, the REM assumptions are more conservative for direct contact with soil (adult and child adherence factors of 0.3 and 1.0 mg/cm^2-day, respectively) than EPA guidance (0.07 and 0.2 mg/cm^2-day, respectively).

3-3. Table I-2: The table shows an error in the inhalation rate used for adults for risks associated with Sample ESB-04-SB 03 and ESB-04-SB 07. A value of 1.3 m^3/kg is recommended by Idaho's REM but a value of 1.1 m^3/kg (child value) was used. This is expected to slightly underestimate risks for inhalation exposure to those two samples. Inhalation risks are negligible and so this error likely does not have an affect on overall risk results.

3-4. Table I-1, I-2: A particulate emission factor (PEF) of 8E+08 m^3/kg was used but no explanation is provided for how this value was derived. EPA's default PEF used in developing the RSLs is 4.63E+09 m^3/kg.

3-5. Table I-1, I-2: Idaho's REM methods for evaluation of inhalation risks/hazards are inconsistent with EPA's methods. EPA recommends using a reference concentration (RfC) for inhalation exposures to noncarcinogenic chemicals and an inhalation unit risk factor (URF) for exposures to carcinogenic chemicals. Instead, Idaho uses simple route-to-route extrapolation of the oral RfD and cancer slope factor (CSF). Use of appropriate toxicity values would change risk results, though the differences are likely negligible.

3-6. Table I-1 and I-2: The tables include inhalation URFs for noncarcinogenic chemicals, when this parameter is used only for carcinogenic chemicals. It is not clear what the values that are currently listed as noncarcinogenic inhalation URFs pertain to. This makes it difficult to determine what values were used in estimating risks. The appropriate toxicity values should include: oral CSF and inhalation URF for the cancer risk evaluation and oral RfD and inhalation RfC for the noncancer hazard evaluation.

3-7. Section 5.1, Table I-1, I-2: The cancer risks for adults do not include exposures during childhood, as dictated in EPA risk assessment guidance.

3-8. Section 5.2: A streamlined risk evaluation is provided yet this section is titled "Baseline." This implies a much more thorough level of risk analysis and should be removed.

3-9. Section 5.2.2.1, Subsections I and II and Section 5.2.2.3, 6.1.1.1: General statements are made regarding risks to other receptor populations (part-time residents, future residents, recreational users/trespassers, workers, etc) that are not supported by quantitative evaluation of these alternative receptors. Recommend providing a more thorough discussion (qualitative or semi-quantitative) to support these statements.

3-10. Section 5.2.2.2, 5.2.2.3, 5.2.2.4: No risks were calculated for ingestion of groundwater (future scenario), contact with surface water and sediment, or contact with LNAPL; therefore, the statements regarding risks associated with exposure to groundwater, surface water, and LNAPL are not supported.

3-11. Section 5.3.2, Pg. 82: Data gaps or uncertainties regarding the home range of ecological receptors and likelihood of ecological receptors drinking from the site shoreline are not justifiable reasons to conclude that "LNAPL is not expected to pose a significant and unacceptable risk," particularly when risks were not even quantified.

3-12. Section 5.3.3.1, Pg. 83: The statement that the LNAPL "may be considered a nuisance and objectionable" and associated discussion of ecological receptor contact with LNAPL completely ignores the potential for toxicity of LNAPL to trout.

3-13. Section 6.1.1.1, 6.1.1.2: The summary of human and ecological risks does not address sediment contamination and exceedance of screening levels discussed previously in Section 5.3.